United States Department of Agriculture

Forest Service

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Route To:

Subject: Evaluation of mortality and blowdown at head of Red Cap Creek (FHP Rept. No. 03-03)
To: District Ranger, Orleans RD

Dave Schultz, Kirk Terrill and Todd Salberg from Hoopa Tribal Forestry examined the fir mortality and blowdown at the head of Red Cap Creek on July 3, 2003.

Most of the mortality that was visible in early July was white fir. The immediate cause of death was infestation by fir engraver beetles, *Scolytus ventralis,* and the fir flatheaded borer, *Melanophila drummondi.* In some areas there was evidence of white fir dwarf mistletoe, *Arceuthobium abietinum* f.sp. *concoloris.* The real underlying causes of mortality were 3 consecutive dry winters from 2000 through 2002, shallow soils, and high levels of stocking. Mortality was visibly lower in areas that had been thinned and had the fuel treated during a previous entry.

Very few red fir had faded, although it was obvious that it was still very early in the season at higher elevations. It is quite possible that some red fir will fade before Fall. There are signs of stress in the red fir stands. Red fir dwarf mistletoe, *Arceuthobium abietinum* f.sp. *magnificae,* was present, and Cytospora canker, caused by *Cytospora abietis*, was causing branch flagging.

All of the fir trees turning color were attacked by the fir engraver or flatheaded borers during the late summer of 2003. Because the most significant contributor to tree mortality was drought, and because the winter of 2002-2003 was wet, the level of successful attacks should be lower this year. The level of tree fading should be lower in 2004, although it will not drop to zero.

Kirk showed us an area of considerable blowdown of white fir in an area currently under a timber sale contract. The area had previously been commercially thinned. The area had signs and symptoms of widespread infection by *Heterobasidion annosum.* Both stumps and windthrown root wads showed laminated decay. Many of the standing trees had rounded tops, indicating a decline in vertical growth in recent years. Several conks of *H. annosum* were found in cut stumps in the area.

The prognosis for the sale area is for slow growth, and additional mortality and blowdown. A number of the trees designated as leave trees in the sale have already died or have been windthrown. The resulting stand looks like it will be understocked. The amount of dead, dying and windthrown timber in the stands looks like a setup for a stand-replacing fire.

There are only a few alternatives to deal with the windthrow and mortality situation.

1. Do nothing. The stocking and spacing will not be the same as the desired condition specified in NEPA documents. There will probably be some additional mortality and windthrow under the most favorable conditions. It is possible that some fir trees will gain enough growing space to add roots faster than the *annosum* root disease will kill roots. There is likely to be a buildup of fuel.

2. Thin some more trees. This might favor a few individual trees, but the stand already appears to be understocked. The stand will probably not live up to its potential. If there is another wind event or drought in the near future, there will be additional blowdown and/or mortality.

3. Regenerate the stand. The *annosum* root disease in the stand would generally affect true firs, and not other species. Although the fungus can live as a saprophyte in stumps until they decay, removal of the living fir trees on the site would hasten the return to lower levels of the disease. There are a few Douglas-fir in the stand, and at least one sugar pine. These species could be left on site without affecting the persistence of the disease. This alternative is likely to produce a closed-canopy stand in the shortest amount of time.

4. Use a borate compound on the stumps of all freshly cut firs 16 inches or greater in diameter. The only currently registered borate compound to prevent infection of stumps by *H. annosum* is Sporax. It is available from the Wilbur Ellis Company. Costs vary by location, and whether the material is applied by contractor, or force account. A rough estimate for planning purposes is about $1 per stump when included as a requirement in a timber sale contract. Some background information on Sporax can be obtained from:
http://www.fs.fed.us/foresthealth/pesticide/data/Sporax_msds.pdf, and also from:
http://infoventures.com/e-hlth/pestcide/borax.html

If you need more information or want to discuss alternatives, please call Dave Schultz at (530) 242-2335 or Pete Angwin at (530) 242-2336.

/s/
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Entomologist